REMARKS/ARGUMENTS

Claims 1, 4-8, 11-13 and 15-20 remain in this application. New Claim 20 has been added.

In the June 27, 2005 Office Action, Claims 1 and 6-8 were rejected under 35 U.S.C. § 103(a) for allegedly being obvious over U.S. Patent No. 6,317,589 to Nash (hereinafter referred to as "Nash") in view of U.S. Patent No. 5,578,917 to Bottman (hereinafter referred to as "Bottman"). Claims 1, 4-8 and 15-17 were rejected under 35 U.S.C. § 103(a) for allegedly being obvious over Nash in view of U.S. Patent No. 3,800,228 to Acker (hereinafter referred to as "Acker"). Claims 4 and 5 were rejected for allegedly being obvious over Nash and Bottman, as applied to independent Claim 1 above, in view of Acker. Claim 11 was rejected for allegedly being obvious over Nash and Bottman, as applied to Claim 6 above, in view of U.S. Patent No. 5,835,850 to Kumar (hereinafter referred to as "Kumar"). Claim 11 was also rejected for allegedly being obvious over Nash and Acker, as applied to Claim 6 above, in view of Kumar. Claim 12 was rejected for allegedly being obvious over Nash and Bottman, as applied to Claim 6 above, in view of U.S. Patent No. 4,492,960 to Hislop (hereinafter referred to as "Hislop"). Claims 12 and 18 were rejected for allegedly being obvious over Nash and Acker, as applied to Claims 6 and 15 above, in view of Hislop. Claim 13 was rejected for allegedly being obvious over Nash, Bottman and Hislop, as applied to Claim 12 above, in view of U.S. Patent No. 5,734,683 to Hulkko (hereinafter referred to as "Hulkko").

Claims 13 and 19 were rejected for allegedly being obvious over Nash, Acker and Hislop, as applied to Claims 12 and 18 above, in view of Hulkko.

Applicant respectfully requests consideration of the claims in view of the remarks provided below.

Claim Rejections – 35 U.S.C. § 103(a), Claims 1 and 6-8

In the November 3, 2004 Office Action, Claims 1 and 6-8 were rejected for allegedly being obvious over Nash in view of Bottman. For the following reasons Applicant disagrees.

Nash discloses a quadrature receiver having a gain compensation loop and a phase correction loop. The gain compensation loop includes a signal strength comparator having in-phase and quadrature signals fed to respective inputs of the signal strength comparator. The signal strength comparator outputs a signal which represents the difference in strength between the in-phase and quadrature signals. The phase correction loop 316 includes a phase detector 320, which is configured to receive I and Q signals from mixers 106 and 308 and generate an output which is proportional to a deviation from ninety degrees in the phase difference between the I and Q signals. The output of the phase detector 320 is input to an optional phase loop filter 322, an output of which is forwarded to an integrator 324. The integrator 324 integrates the phase detector output and generates a phase correction voltage which may be applied to a phase shifter 314. The phase correction loop 316 adjusts a voltage control to the phase shifter 314 until the phase difference between the I and Q channels is exactly ninety degrees.

Bottman discloses a sampling circuit for testing a device under test (DUT). The sampling circuit includes a pulse generator 100, a sample-and-hold (S/H) circuit 120, an analog-to-digital converter (ADC) 130, an acquisition memory 40, an acquisition time controller (ATC) 150, a microprocessor 180, a pulse delay line 160, and a sample delay line 170. The pulse generator produces a stimulus pulse 10, which is launched down a transmission line 110a to the DUT. The DUT responds to the stimulus pulse 10 by generating a response signal 20. The response signal 20 is transmitted to the S/H circuit 120 via a transmission line 110b. The S/H circuit 120 captures the instantaneous analog voltage level of the response signal 20 according to a sample trigger received at a sample input of the S/H/ circuit 120. The instantaneous analog voltage level captured by the S/H circuit 120 is sent to the ADC 130, which converts the captured instantaneous analog voltage level to a digital sample. The digital sample is then stored in an acquisition memory 40. The microprocessor 180 has a first output coupled to a control input of the pulse delay line 160, and a second output coupled to a control input of the sample delay line 170. The microprocessor 180 is further coupled to the ATC 150, so that various combination of delay settings of the pulse delay line 160 and the sample delay line 170 may be coordinated with control signals generated by the ATC 150. By repetitively launching a series of stimulus pulses 10 down the transmission line 110a, and digitally sampling selected points of the response signal 20 using the S/H circuit 120 and ADC 130, a digital representation of the response signal 20 is generated and stored in the acquisition memory 40.

By contrast, independent Claim 1 of the present invention claims a "method of receiving a communications signal to produce two output signals in quadrature relation to one another", where an "error signal" is used to adjust a "dual delay line". As explained in detail below, Nash and Bottman, whether considered individually or in combination, fail teach or suggest this aspect of Claim 1.

Section 2143.03 of the M.P.E.P. directs that "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." Applicant respectfully believes that this requirement for establishing a *prima facie* case of obviousness has not been satisfied. Claim 1 recites that the relative delay between two reference signals is controlled by a "dual delay line". Further, Claim 1 recites how this "dual delay line" is controlled by an "error signal". It is acknowledged in the Office Action that Nash does not teach or suggest a "dual delay line". However, it is suggested that Bottman does. For the following reasons, Applicant respectfully disagrees.

The combination of the "pulse delay line 160" and the "sampling delay line 170" in Bottman does not form a "dual delay line", let alone a dual delay line controlled by a single control signal (e.g. the single "error signal" in Claim 1). The separate delay lines 160 and 170 each have their own separate control inputs. Each control input is configured to receive separate and independent control signals, which individually control the delays of separate delay lines 160 and 170. Accordingly, modifying Nash by Bottman does not result in a method that uses a dual delay line to alter the relative delay between two reference signals based on a single error signal. Further, there is no

teaching or suggestion of modifying the separate and independent delay lines 160 and 107 in a manner that would allow them to implement a dual delay line controlled by a single control signal. Accordingly, because the cited prior art, whether considered alone or in combination, fails to teach or suggest this aspect of independent Claim 1, Applicant respectfully believes that that § 103 rejection cannot be properly maintained.

Applicant also respectfully believes that Bottman is nonanalogous art, and, being so, cannot be properly relied on to form a legitimate § 103 rejection of independent Claim 1. Section 2141.01(a) of the M.P.E.P. directs that "[i]n order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." (quoting *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)).

Bottman is in the field of testing. By contrast, Applicant's field of endeavor is that of communications circuits. Despite this clear distinction, in the Office Action a conclusory statement is made that "Nash and Bottman are analogous art because they are from the same field of endeavor." It is not clear from this statement whether the Examiner is suggesting that Bottman is within the same field of endeavor as Nash, or whether both Nash and Bottom are considered to be within the same field of endeavor as Applicant's endeavor. Despite this uncertainty, it is the latter relationship which must be satisfied to apply and maintain the proposed modification. Except for the conclusory statement made in the Office Action, no explanation is provided as to why it is believed Bottman is within Applicant's field of endeavor. Applicant respectfully requests,

therefore, that the § 103 rejection be withdrawn or some convincing line of reasoning be provided as to why it is believed Bottman is within the same field of Applicant's endeavor.

Further, the problem of improving the sampling resolution of a test apparatus disclosed by Bottman is not something that would have been considered reasonably pertinent by one of ordinary skill in the art in addressing the problem of achieving quadrature alignment in a communications system. Bottman is in no way concerned with quadrature alignment in communications receivers, as independent Claim 1 is. This should not be surprising since Bottman has nothing to do with communication receivers, but is rather directed at a test apparatus for testing devices connected to a network.

For at least the foregoing reasons, Applicant respectfully believes that Bottman is nonanalogous art and, consequently, the § 103 rejection of independent Claim 1 cannot be properly maintained.

Independent Claim 6 was also rejected for allegedly being obvious over Nash in view of Bottman. Applicant respectfully disagrees with this rejection for reasons similar to that provided above in responding to the rejection of independent Claim 1. In particular, there is no teaching or suggestion of a "dual delay line" being "operable to respond to [an] error signal..." in the cited references. This is true whether the references are considered individually or in combination. As explained above in response to the rejection of independent Claim 1, each of the separate delay lines 160 and 170 in Bottman are independently controlled by separate control signals and are not responsive to a single error signal. Accordingly, they cannot be collectively considered as being a

"dual delay line", as such a dual delay line is recited in independent Claim 6. Further, there is no teaching or suggestion as to how those separate and individually controlled delay lines might be configured as a "dual delay line" that is controlled by a single error signal. Finally, as explained above in response to the rejection of independent Claim 1, Bottman is nonanalogous art. For at least these reasons, therefore, Applicant respectfully believes that the § 103 rejection of independent Claim 6 cannot be properly maintained, and Applicant requests that the rejection be withdrawn.

Claims 7 and 8 were also rejected for allegedly being obvious over Nash in view of Bottman. However, since Claims 7 and 8 both depend from independent Claim 1, they derive patentability for depending on what appears to be an allowable base claim. Applicant requests, therefore, that the § 103 rejections of dependent Claims 7 and 8 also be withdrawn.

Claim Rejections – 35 U.S.C. § 103(a), Claims 1, 4-8 and 15-17

In the Office Action, Claims 1, 4-8 and 15-17 were rejected under 35 U.S.C. § 103(a) for allegedly being obvious over Nash in view of Acker. For the following reasons, Applicant respectfully disagrees.

Acker discloses a modem having a phase jitter compensator. As explained in column 1, lines 59-62 of Acker, instability of modulating and demodulating-carrier generators in a telephone modem causes a random jitter in the phase of a received signal in an Automated REAL Time Equalized Modem (ARTEM). The apparatus in FIG. 10 of Acker, which is relied on to support the § 103 rejections of Claims 1, 4-8 and 15-17,

takes into account a delay involved in estimating a proper phase for demodulation. The upper half of FIG. 10 includes circuitry for demodulating the data from the carrier, while the lower half of FIG. 10 determines the carrier phase error angle θ or, more specifically the sine and cosine of the phase error signal θ. The upper half also includes in-phase and quadrature delay lines 1014 and 1015, which delay the data signals so that their delay is equal to the carrier phase estimation delay at the point where the final carrier phase correction is applied. There is no teaching or suggestion that the in-phase or quadrature delay lines 1014 and 1015 are delayed relative to one another in order to achieve quadrature alignment of the I and Q channels.

Independent Claim 1 of the present invention, by contrast, claims a "method of receiving a communication signal to produce two output signals in quadrature relation to one another" where an "error signal" is used "to adjust [a] dual delay line in order to alter a relative delay between...two reference signals." It is acknowledged in the Office Action that Nash fails to teach or suggest these aspects of independent Claim 1. Nevertheless, it is asserted in the Office Action that "Acker discloses using an adjustable delay line in order to alter relative delay between two [I and Q] signals...." Applicant respectfully disagrees.

Section 2143.03 of the M.P.E.P. directs that "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." There is no teaching or suggestion in Acker that the in-phase or quadrature delay lines 1014 and 1015 are delayed relative to one another in order to achieve quadrature alignment of the I and Q channels. (Note that Claim 1 also recites

that the "two reference signals" which are delayed relative to each other by the dual delay line are also both derived from the dual delay line.) Indeed, there is no teaching or suggestion, whatsoever, that the delays of delay lines 1014 and 1015 are delayed relative to one another. In other words, it would appear that the delays of both the in-phase and quadrature delay lines 1014 and 1015 both have the same delay values, and that the delay value implemented by both delay lines 1014 and 1015 causes the demodulated data to have the proper timing relationship with the carrier phase determining section of the lower half of the carrier phase error angle determining apparatus. No teaching or suggestion of achieving quadrature alignment of I and Q reference signals is provided. Accordingly, for at least this first reason, the § 103 rejection of independent Claim 1 cannot be properly maintained, and Applicant requests that it be withdrawn.

Second, there is no teaching or suggestion in either Nash or Acker that the demodulated data signal delay lines 1014 and 1015 might possibly be used to form a "dual delay line" that implements a relative delay between two reference signals, or of a dual delay line that is controlled by an error signal. Section 2143.01 of the M.P.E.P. directs that: "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." Here, there is no teaching, suggestion or motivation to modify the phase adjusting element in Nash so that it could be a dual delay line having the operational characteristics claimed in the method of Claim 1 of the present application. Without the benefit of some

legitimate prior art reference, it cannot be said that those of ordinary skill in the art would have found it obvious to use a "dual delay line" in a quadrature receiver in the manner that independent Claim 1 recites. Indeed, it would appear that, only with the benefit of Applicant's disclosure, i.e., only with hindsight, could the argument be made that the claimed subject matter is obvious. However, hindsight is not permitted in making an obvious rejection. (See M.P.E.P. 2141 which cautions that the "references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. ")

Finally, even if it could be said that Acker teaches or suggests all of the claim limitations of independent Claim 1, Applicant respectfully believes that Acker is non-analogous art, and, therefore, cannot be properly used in an attempt to modify Nash. (This observation was pointed out in the previous response.) Section 2141.01(a) of the M.P.E.P. directs that "[i]n order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." (quoting *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992)). Here, Acker, which is in the field of a particular type of modem (i.e. ARTEM modems), is not within the field of Applicant's endeavor. Further, the problem addressed in Acker, which was of reducing phase jitter in a modem, cannot be properly considered to be reasonably pertinent to the problems the inventors of the present application were concerned with, which is of achieving quadrature alignment of two reference signals in a communications receiver.

Despite this distinction, in the Office Action a conclusory statement is made that "Nash and Acker are analogous art because they are from the same field of endeavor." It is not clear from this statement whether the Examiner is suggesting that Acker is within the same field of endeavor as Nash, or whether both Nash and Acker are considered to be within the same field of endeavor as Applicant's endeavor. Despite this uncertainty, it is the latter relationship that must be satisfied to sustain the proposed modification, and to form a proper § 103 rejection. Except for the conclusory statement made in the Office Action, no explanation is provided as to why it is believed Acker is within Applicant's field of endeavor. Applicant respectfully requests, therefore, that the § 103 rejection be withdrawn or some convincing line of reasoning be provided as to why it is believed Acker is within the same field of Applicant's endeavor.

For at least the foregoing reasons, Applicant respectfully believes that the § 103 rejection of independent Claim 1, as allegedly being obvious over Nash in view of Acker, cannot be properly maintained. Substantially the same reasons apply to the rejection of independent Claim 15. For example, whether considered alone or in combination, Nash in view of Acker fails to teach or suggest an apparatus having a "dual delay line" that is "configured to receive an error signal from [an] error signal generator and generate I and Q reference signals having a relative delay that is dependent on the error signal." Indeed, as explained above, it would appear that the delays of both the in-phase and quadrature delay lines 1014 and 1015 both have the same delay values, and because of this, quadrature alignment of I and Q reference signals is not a problem that is even addressed by Acker.

Remaining Dependent Claims

The remaining claims were rejected in the Office Action based on various combinations and modifications of Nash by either Bottman or Acker and other alleged prior art references. As explained above, however, both Bottman and Acker are believed to be nonanalogous art. Accordingly, the § 103 rejections of the dependent claims are believed to be improper, irrespective of the additional prior art references. Aside from the nonanalogous art issue, it has been demonstrated above that Nash in view of either Bottman or Acker fail to teach or suggest all of the claim limitations of independent Claims 1, 6 and 15. Hence, by virtue of their dependence on independent Claims 1, 6 and 15, the remaining dependent claims derive patentability for what appear to be allowable base claims (i.e. independent Claims 1, 6 and 15). The addition of, or modification of Nash, Bottman and/or Acker by the additional references (Kumar, Hislop and Hulkko) do nothing to alter this result. Accordingly, Applicant requests that, in addition to the withdrawal of the § 103 rejections of independent Claims 1, 6 and 15, the § 103 rejections of the remaining dependent claims also be withdrawn.

CONCLUSION

For at least the foregoing reasons, Applicant believes all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner has any further questions or comments concerning the amendments made herein, he is encouraged to telephone the undersigned at 408-282-1857.

Respectfully submitted,

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